

What is claimed is:

1. A voltage regulator of a vehicle AC generator including a field circuit having a field coil and a plurality of magnetic poles and a output circuit having an armature coil, said voltage regulator comprising:

first means, connected to said armature coil, for detecting a self-excited voltage that is induced in said armature coil by a residual magnetic flux of said rotor;

second means for supplying field current to said field coil when said self-excited voltage is detected; and

third means, including a bypass circuit connected to a ground, for decreasing resistance of said bypass circuit when said second means does not supply field current and increasing said resistance of said bypass circuit when said second means supplies field current to said field coil.

2. The voltage regulator as claimed in claim 1, wherein said third means comprises a switching circuit connected to said bypass circuit.

3. The voltage regulator as claimed in claim 1, wherein said third means comprises a circuit for decreasing said resistance of said bypass resistor after increasing said resistance for a predetermined duration.

4. The voltage regulator as claimed in claim 1, wherein

said first means comprises a power drive circuit including a pulse conversion circuit for converting said self-excited voltage into a binary pulse signal;

said second means comprises a control circuit for controlling said field current, and a power circuit connected to said control circuit; and

said power-drive circuit supplies electric power to said power circuit according to said binary pulse signal.

5. The voltage regulator as claimed in claim 4, wherein said armature coil of said AC generator include a plurality of phase-windings; and

said pulse conversion circuit comprises a number of comparators respectively connected to the same number of said phase-windings to convert said self-excited voltage into a binary pulse signal having the same number of times as many frequencies as said self-excited voltage.

6. The voltage regulator as claimed in claim 1, wherein said first means detects a voltage level of said self-excited voltage.

7. The voltage regulator as claimed in claim 1, wherein said first means detects the frequency of said self-excited voltage.

8. A voltage regulator of a vehicle AC generator

including a field circuit having a field coil and a plurality of magnetic poles and an output circuit having an armature coil, said voltage regulator comprising:

a control circuit for supplying field current to said field coil;

a power circuit for supplying electric power to said control circuit to operate the same;

a power drive circuit for controlling said power circuit according to a self-excited voltage induced in said armature coil, said power drive circuit including a pulse conversion circuit for converting said self-excited voltage into a binary pulse signal; and

means, including a bypass circuit connected to a ground, for decreasing resistance of said bypass circuit when said power circuit does not supply electric power to said control circuit and increasing said resistance of said bypass circuit when said power circuit supplies electric power to said control circuit.

9. A voltage regulator of a vehicle AC generator for charging a battery, said AC generator including a field circuit having a field coil and a plurality of magnetic poles, an output circuit having a plurality of phase-windings and a rectifier unit for providing DC output power, said voltage regulator comprising:

a switching circuit for controlling field current to be supplied to said field coil;

a switch control circuit for controlling said switching circuit;

a power circuit connected to said switch control circuit;
and

a power-drive circuit including a pulse conversion circuit for converting said self-excited voltage into a binary pulse signal, said drive circuit driving said power circuit for a predetermined period from an edge of said pulse signal.

10. The voltage regulator as claimed in claim 9, wherein said pulse conversion circuit forms said pulse signal having a plurality of times as many frequency as a frequency of said output voltage.

11. The voltage regulator as claimed in claim 9, wherein said power-drive circuit forms said pulse signal having two times as many frequencies as a frequency of said output voltage from a pair of said phase-windings whose phases are 90 ° different from each other.

12. The voltage regulator as claimed in claim 9, wherein said power-circuit drive circuit drives said power circuit when said rectifier unit provides an output voltage that is higher than a predetermined voltage.

13. The voltage regulator as claimed in claim 9, wherein said power-circuit drive circuit has a switch for opening

or closing a circuit connecting said battery and said power line.